查询WE9187供应商

GENERAL DESCRIPTION

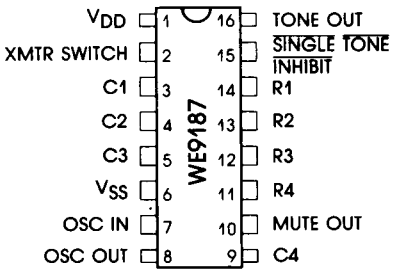
The WE9187 is a monolithic CMOS integrated circuit designed for Dual-Tone-Multi-Frequency (DTMF) telephone dialing.

The WE9187 was designed specifically for the performance: single contact static keyboard inputs, single tone inhibit option, wide-supply operation with regulated output, and opposite-polarity logic output (one with push-pull output and the other with open emitter output).

FEATURES

- Low Standby Power I_{STBY} = 0.25μA (TYP.) @ V_{DD} = 3.5V
- Auxiliary Switching Functions on chip
- Minimum External Parts
- Uses Inexpensive 3.579545MHz Television Color-Burst Crystal to Provide High Accuracy Tone
- On-Chip-Regulation of Dual and Single Tone Amplitudes
- Interfaces Easily in Electronic or μP Dialing Applications
- Multiple Key Entry Pin Selectable to Either Single Tone or No Tone
- 16 Pin DIP Plastic Package

PIN CONFIGURATION



XMTR SWITCH = TRANSMITTER SWITCH

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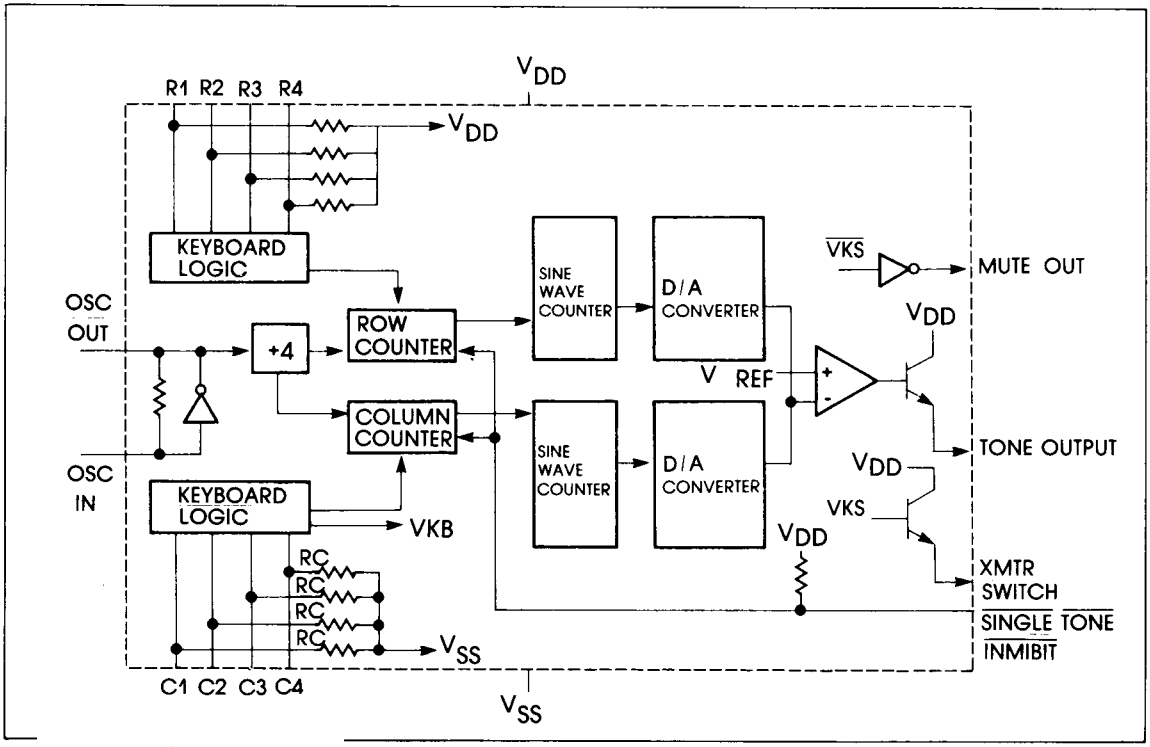
ABSOLUTE MAXIMUM RATINGS

CHARACTERISTICS	SYM	RATING	UNIT
Supply Voltage (relative to V)	V_{DD}	10.5	V
Input Voltage Range	V_{IN}	$-0.3+V^{-}$ to $+0.3+V_{DD}$	V
Power Dissipation Per Package For Ta=25°C	P_D	500	mW
For Ta=25 to +60°C		Derate Linearly to 150	
Operating Temperature	T_A	−30 to +60	°C
Storage Temperature	T_{STG}	−55 to +150	°C
Lead Temperature	T_L	+265	°C

BLOCK DIAGRAM



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ELECTRICAL CHARACTERISTICS

[V_{DD} is referenced to V_{SS}]

CHARACTERISTICS	SYMBOL	TEST CONDITION	LIMIT −30°C < Ta < 60°C			UNIT
			MIN	TYPE	MAX	
Supply Voltage	V_{DD}	———	3.5	-	10.0	V
Single Tone Inhibit Input High (Logic 1)	$V_{IH(S)}$	———	$0.7V_{DD}$	-	V_{DD}	
Input Low (Logic 0)	$V_{IL(S)}$		0.0	-	$0.3V_{DD}$	
Input High (Col ON)	$V_{IH(C)}$	———	$0.7V_{DD}$	-	V_{DD}	
Input Low (Col OFF)	$V_{IL(C)}$		0.0	-	0.1V	
Input High (Row OFF)	$V_{IH(R)}$	———	$0.9V_{DD}$	-	V_{DD}	
Input Low (Row ON)	$V_{IL(R)}$		0.0	-	$0.3V_{DD}$	
Output Voltage Row Tone	$V_O(R)$	$3.5V \le V_{DD} \le 10.0V$ R1 = 1KΩ , Ta = 25°C True RMS Reading	317	400	504	mVrms
Column Tone	$V_O(C)$		396	500	630	
Tone Output External Load Impedence	R1	V_{DD} = 3.5V	620	-	-	Ω
		V_{DD} = 10V	330	-	-	
XMTR Output Current No Keyboard Entry	I_{OHX}	V_{DD} = 3.5V, V_{OHX} = 2.5V	−15	−25	-	mA
		V_{DD} = 10V, V_{OHX} = 8.0V	−40	−200	-	
Keyboard Entry	I_{OLX}	V_{DD} = 10V, V_{OLX} = 0.0V	-	0.1	10.0	μA
Mute Output Current No Keyboard Entry	I_{OLM}	V_{DD} = 3.5V, V_{OLM} = 0.5V	0.5	2.0	-	mA
		V_{DD} = 10V, V_{OHX} = 0.5V	1.0	4.0	-	
Keyboard Entry	I_{OHM}	V_{DD} = 3.5V, V_{OLM} = 0.5V	−0.5	−2.0	-	
		V_{DD} = 10V, V_{OHX} = 0.5V	−1.0	−4.0	-	
Standby Current (No Keyboard Entry)	I_{STBY}	All output unloaded, Current output of Pin6 V_{DD} = 3.5V	-	0.25	100	μA
		V_{DD} = 10V	-	0.5	200	
Operating Current Keyboard Entry	I_{OP}	All output unloaded. True RMS Reading. Current out of Pin 6 Note 1. V_{DD} = 3.5V	-	1.0	2.0	mA
		V_{DD} = 10V	-	5.0	15	

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Input Resistanceent Single Tone Inhibit	Rin(S)	Ta=25°C	20	-	100	KΩ
Tone Output No Keyboard Entry	V_{NOISE}	@600Ω	-	-	-80	dBm
Tone Output Rise Time	T_R	Note 1, 2	-	3	5.0	mS
Pre-Emphasis		Vo(C)/Vo(R)	1.0	2.0	3.0	dB
Output Distortion	THD	Note 3	-	-	-20	dB

Note 1: Crystal parameters defined as Rs 100Ω , Lm=96mH, Cm=0.25PF, and Ch=5PF, F=3.579545MHz, Cl=18PF

Note 2: Time from a valid Keystroke with no bounce to allow wave to go from minimum to 90% of the final magnitude of either frequency.

Note 3: Measured in terms of Total Out-of-Band power Relative to sum of Row & Column Fundamental Power.

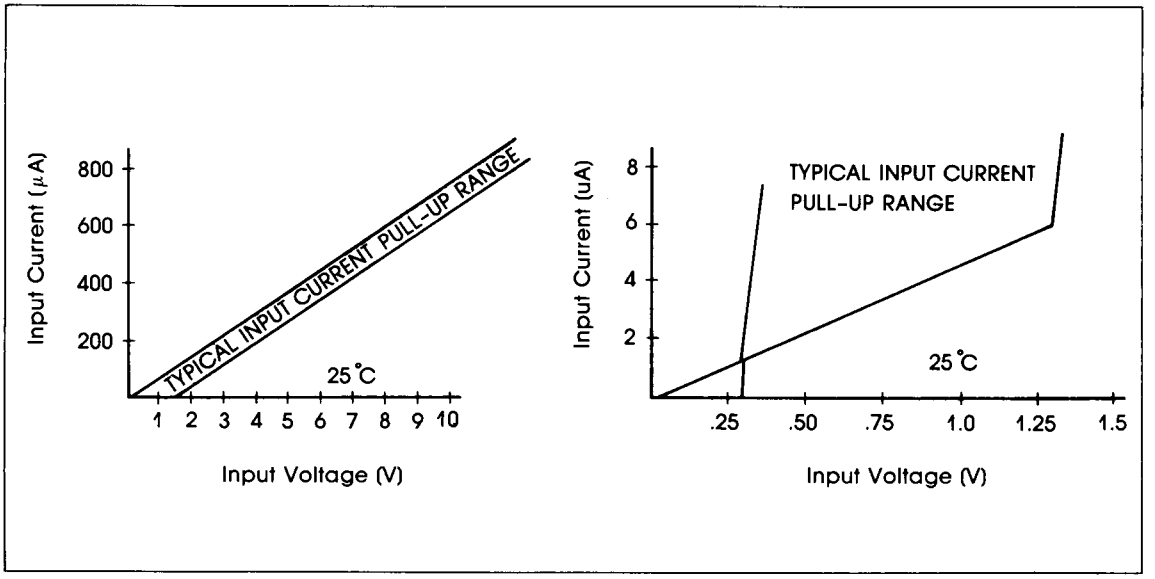

Figure 1 Input Current VS Input Voltage Characteristic

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TABLE 1 Output Frequency Deniation

FREQUENCY	STANDARD DTMF (HZ)	TONE OUTPUT FREQUENCY USING 3.579545MHZ CRYSTAL	% DEVIATION FROM STANDARD
f1	697	701.3	+0.62
f2	770	771.4	+0.19
f3	852	857.2	+0.61
f4	941	935.1	−0.63
f5	1209	1215.9	+0.57
f6	1336	1331.7	−0.32
f7	1477	1471.9	−0.35
f8	1633	1645.0	+0.73

FUNCTION DESCRIPTION

A. OSCILLATOR

Any crystal frequency deviation from 3.579545MHz will be reflected in the tone output frequency. Most crystals vary no more than ±0.02%.

B. ROW & COLUMN INPUTS

The WE9187 features inputs compatible with the inexpensive single-contact (form A) keyboard, and electronic input. Following figure shows, Rr1 and Rc1 pull in opposite directions and hold their associated input sensing circuit turned off. When one or more row or column inputs are tied together; however, the input sensing circuits sense the "1/2 Level" and driver a logic signal to the internal circuit of the WE9187 and cause the proper tone or tones to be generated. When operating with a keyboard, normal operation is for dual tone generation when any single button is pushed, and single-tone operation when two or more button in the same row or wlumn is pushed. Activation of diagonal button will result in no tone being generated. When the inputs to the WE9187 are electronically activated, input to a single row and column will result in that dual tone digit's being generated. Input to a single column will result in that column tone being generated. Input to multiple columns will result in no tone being generated. Activation of a single row is not sensed by the internal circuit of the WE9187. If a single row tone is desired, two columns must be activated along with the desired row.

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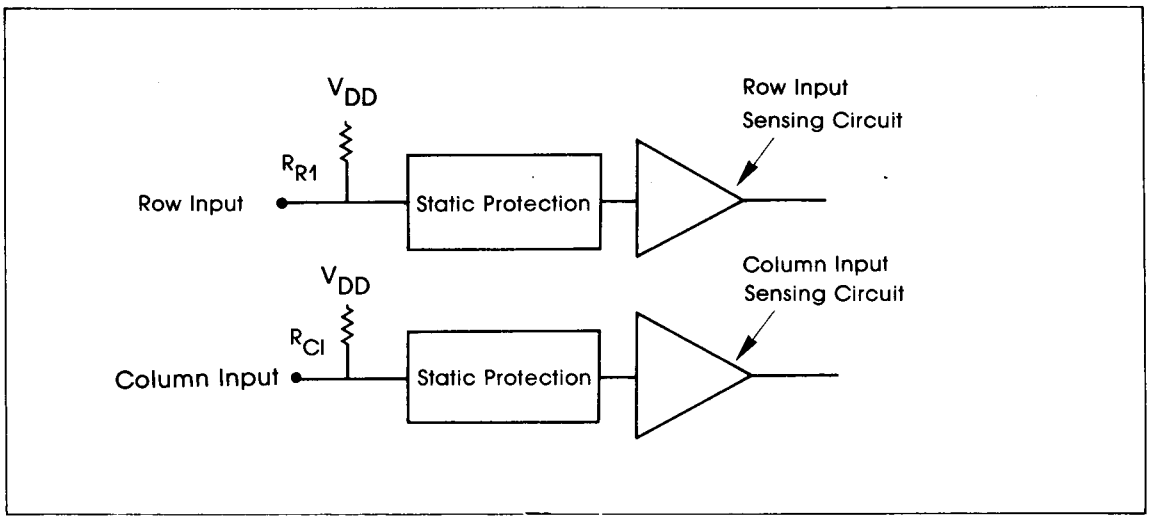

C. SINGLE TONE INHIBIT

The Single-Tone Inhibit input is used to inhibit the generation of other than dual tones. It has a pull up to the V_{DD} supply and, when left floating or tied to V_{DD}, single or dual-tone may be generated as described in the paragraph under row-column inputs. When forced to the V_{SS} supply, any input situation that would normally result in a single tone will now result in no tone, with all other chip functions operating normally.

D. XTMR SWITCH

The pin is connected to the emitter of an on-chip bipolar transistor whose collector is connected to V_{DD}. With no Keyboard input this transistor is turned on and pulls pin 2 up to the V_{DD} supply. When a keyboard entry is sensed, this output goes open circuit (high impedence). The XMTR switch output switches regardless of the state of Single Tone Inhibit input.

E. TONE OUTPUT

The tone output pin is connected internally in the WE9187 to the emitter of an NPN transistor whose collector is tied to V_{DD}. The input to this transistor is the on-chip operation amplifier which mixes the row and column tones together and provides output level regulation.

F. MUTE OUT

The mute output is a conventional CMOS gate that pulls to V_{SS} with no keyboard input and pulls to the V_{DD} supply when a keyboard entry is sensed. This output is used to control auxiliary switching functions that are required to actuate upon keyboard input. The mute output switch regardless of the state of the Single Tone Inhibit input.

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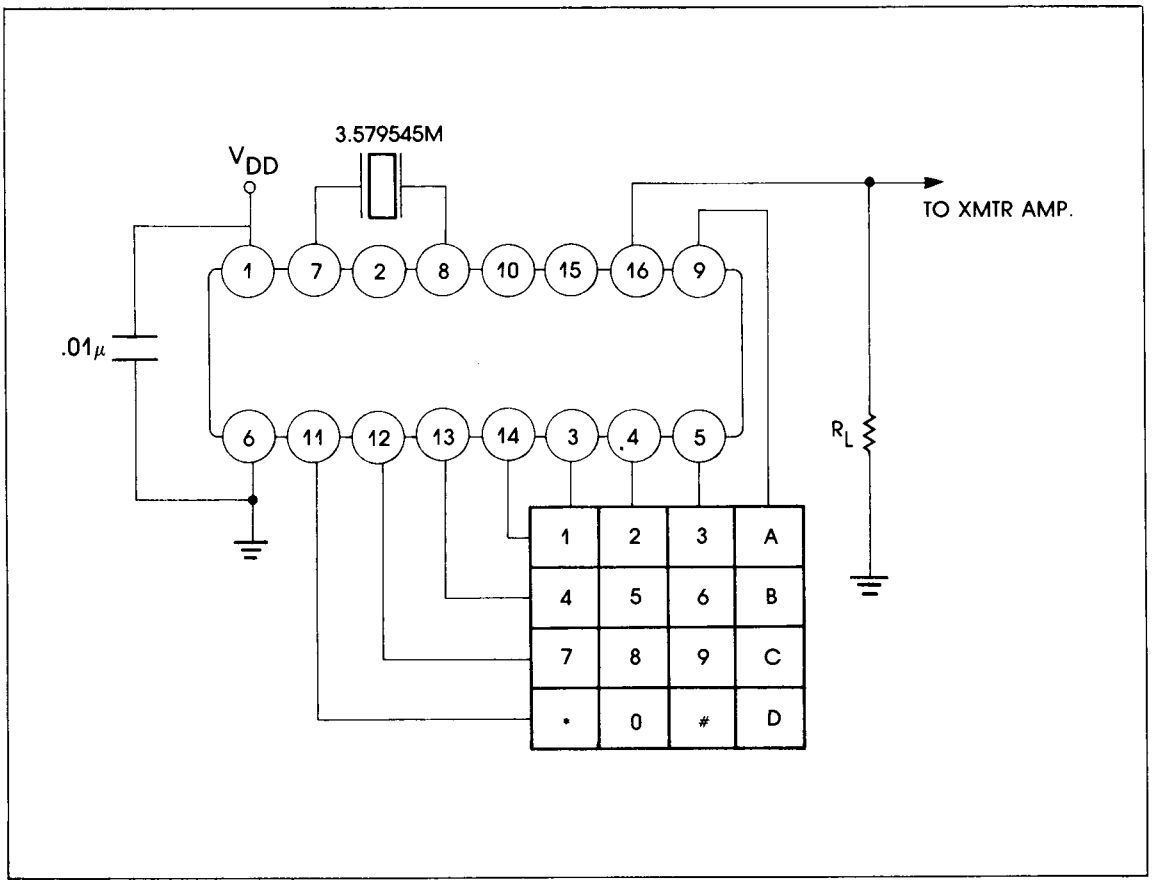
APPLICATION CIRCUITS



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